Electronic Services - Los Angeles
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Bailey

SECTION
P92-27

PRODUCT INSTRUCTIONS

PNEUMATIC TRANSMITTER
CLASS PA, PB, AND PC

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Class PA, PB, and PC Pneumatic Transmitters are used in Type KM5□ or WM5□ Recorders or Indicators to produce an output pressure proportional to the mechanical input from an actuating unit mounted in another Case position in the Recorder or Indicator.

CROSS REFERENCES

Instrument or Equipment	Instruction Section
Type KM55 or WM55 Recorder and Type KM53 or WM53 Indicator	E12-3
Reset Booster Relay	P99-7
Connecting Tubing	G18-2

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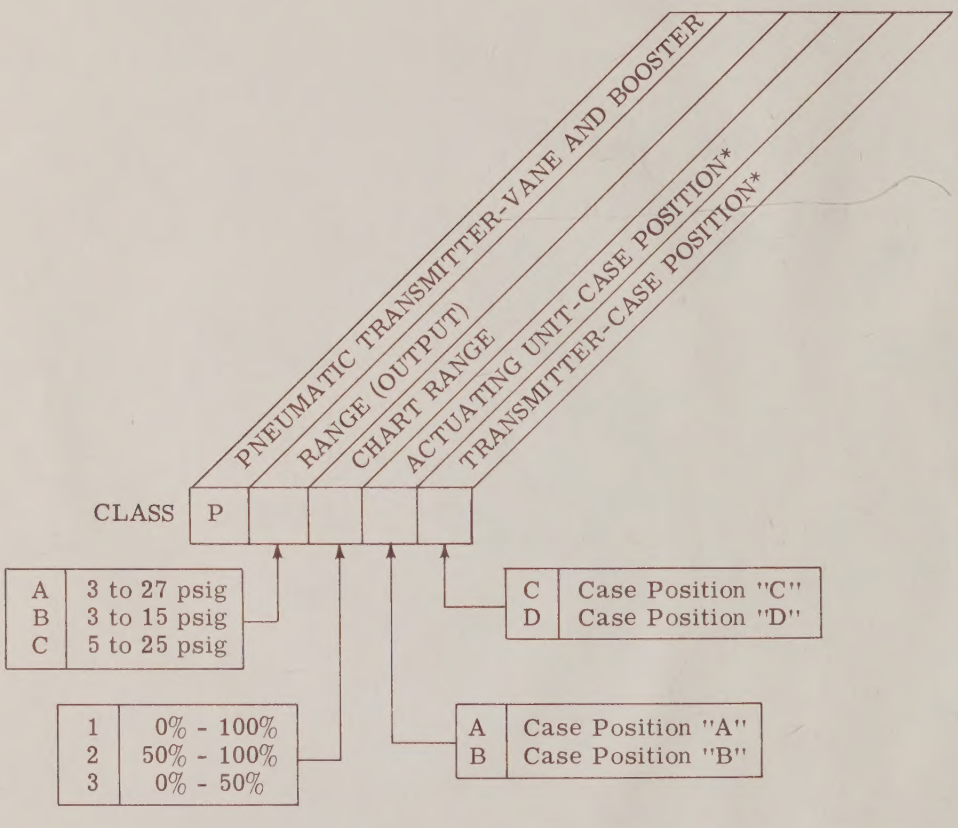
FORM IP92-27-868

EXPLANATION OF NOMENCLATURE



*Refers to Case positions of Type KM5□ or WM5□ Recorder or Indicator.

An "X" in any Nomenclature position indicates that in that respect the instrument is special. An "X" as a suffix to the Nomenclature indicates that the instrument includes some special feature not covered by Nomenclature.

INSTALLATION

The adjustable links shown in Figure 4 transmit motion of the recording pen or indicating pointer yoke to the Class P drive arm. The Transmitter requires a different link for each Recorder or Indicator case position. Each link is stamped with the letter (C7 and D7) of the case position in which it is located.

If Class P Transmitter is already installed in Recorder or Indicator case:

1. Install KM or WM Recorder or Indicator case as outlined in Instruction Section E12-3.

2. Make tubing connections to Transmitter

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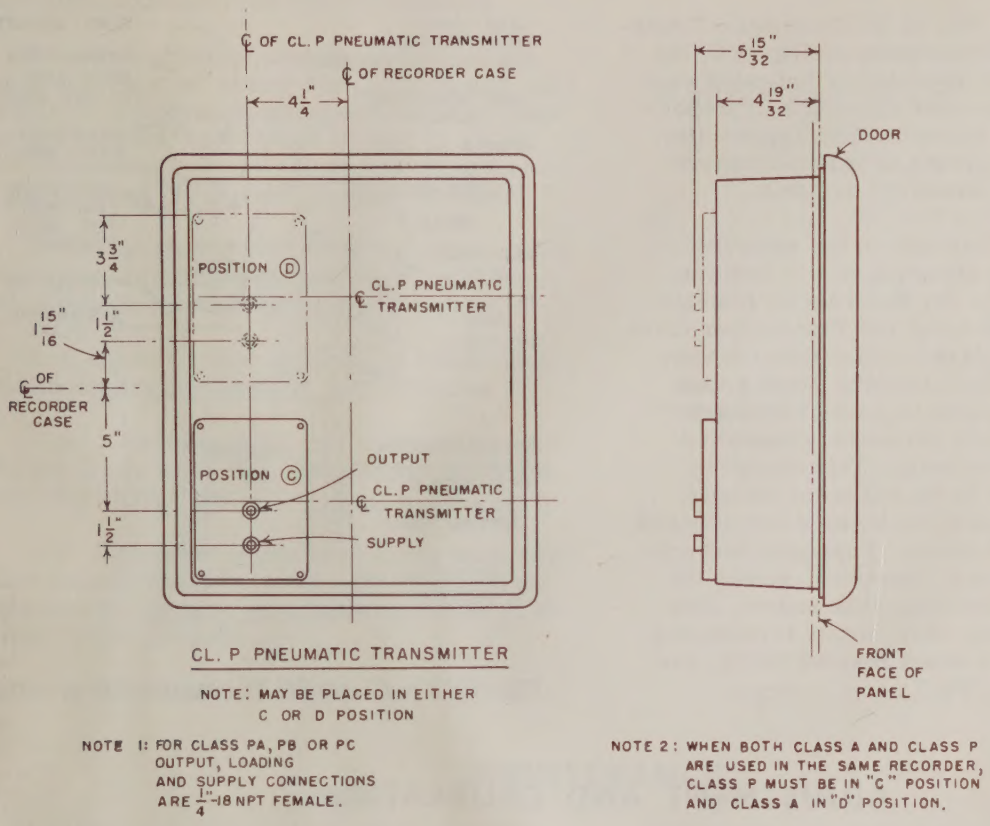

℄ OF CL. P PNEUMATIC TRANSMITTER
℄ OF RECORDER CASE
4 1/4"
3 3/4"
POSITION (D)
CL. P PNEUMATIC TRANSMITTER
1 15/16"
1 1/2"
℄ OF RECORDER CASE
5"
POSITION (C)
OUTPUT
CL. P PNEUMATIC TRANSMITTER
SUPPLY
1 1/2"
CL. P PNEUMATIC TRANSMITTER
NOTE: MAY BE PLACED IN EITHER C OR D POSITION
NOTE 1: FOR CLASS PA, PB OR PC OUTPUT, LOADING AND SUPPLY CONNECTIONS ARE 1/4"-18 NPT FEMALE.
5 15/32"
4 19/32"
DOOR
FRONT FACE OF PANEL
NOTE 2: WHEN BOTH CLASS A AND CLASS P ARE USED IN THE SAME RECORDER, CLASS P MUST BE IN "C" POSITION AND CLASS A IN "D" POSITION.

FIGURE 1 - Mounting Dimensions for Class P□ Pneumatic Transmitter

at rear of Recorder or Indicator case (see Figure 1). For recommended methods of installing connecting tubing, refer to Instruction Section G18-2.

3. For a Recorder, place pens in service as outlined under "Placing Pens in Service" in Instruction Section E12-3.

4. Check Calibration as outlined on page 4.

If Class P Transmitter is being added to Recorder or Indicator case, follow the instructions on the special installation sheet accompanying the Transmitter.

If Class P Transmitter is to be moved from one component position to another:

1. Remove blank cover from desired Recorder or Indicator case position or remove any other component mounted in that position.

2. Disconnect pen or pointer linkage from drive arm. Then disconnect tubing from Transmitter (see Figure 1).

3. Remove Transmitter and attached support plate from case.

4. Insert Transmitter in new component position (Figure 1). Secure support plate to case with four mounting screws.

5. Install adjustable link stamped with applicable case position (C7 or D7) and applicable drive arm and drive arm extension (see Figure 4).

6. Perform steps 2 and 4 under "If Class P Transmitter is already installed in Recorder or Indicator case" on page 2.

OPERATION

The Class PA, PB, or PC Pneumatic Transmitter is shown schematically in Figure 2. An actuating unit in the Recorder or Indicator case positions the Transmitter drive link in proportion to a measured variable. The Transmitter establishes and transmits an output pressure proportional to the measured variable.

An increase or decrease in the measured variable causes the actuating unit to position connecting linkage in the Recorder or Indicator case, producing motion of the Transmitter drive link. This motion is transmitted thru the vane drive link which repositions the flexible vane in relation to the nozzle to produce a proportional change in output pressure transmitted by the Reset Booster Relay. This change in pressure is applied to the restoring bellows, producing movement of the bellows and attached restoring beam and nozzle. Expansion and contraction of the bellows, therefore, moves the restoring beam to reposition the nozzle, thus restoring the original vane-nozzle relationship. For operation of the Reset Booster Relay, see Instruction Section P99-7.

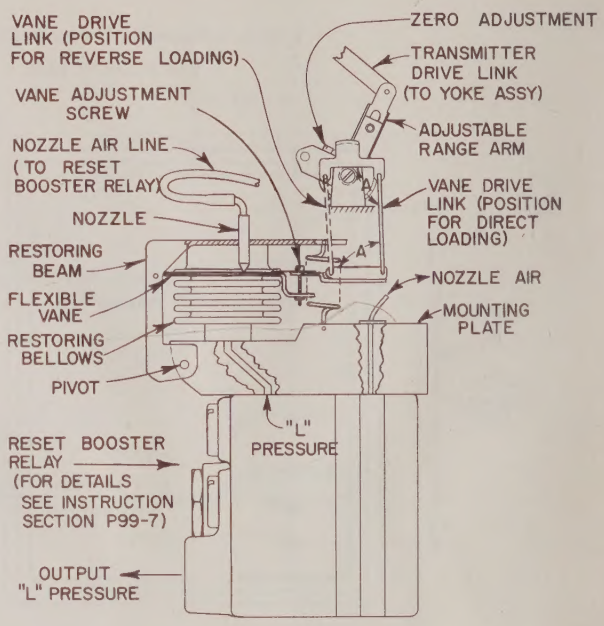


FIGURE 2 - Class P□ Pneumatic Transmitter

ADJUSTMENT AND CALIBRATION

The instructions below apply specifically to instruments with standard calibration, that is, where full pen or pointer motion is produced by full range variation in pressure. If calibration is non-standard, that is, where partial pen or pointer motion is produced by full range pressure variation (Class P□2 or Class P□3), modify the standard pressures and chart or scale readings as necessary.

1. Check calibration of actuating unit as outlined in applicable Instruction Section.

2. Connect a test gage in Transmitter output pressure line (Figure 2). Apply supply pressure to Transmitter supply connection. Check entire installation for leakage with a soapsuds solution.

3. Adjust actuating unit so pen or pointer reads zero chart or scale.

NOTE: Do not block linkage or pen yoke to set pen or pointer of actuating unit as required in the steps below; set pen or pointer positions as follows:

a. For Pneumatic Receivers, apply controlled inputs to Receiver to set pen.

b. For Electric Receivers, remove power from Receiver by pulling Receiver plug from its receptacle in central wiring channel on back of Recorder. Then remove front cover from Receiver and manually rotate slidewire disc to set pen.

c. For a Class 2A or 8D unit, apply controlled inputs from calibrating device as outlined in applicable instruction section. For a Class 4M unit, position linkage manually.

4. With pen or pointer reading zero chart or scale, test gage should read Transmitter minimum output pressure. If not, turn zero adjustment screw (Figure 3) of worm gear mechanism to obtain correct reading.

5. Adjust actuating unit so pen or pointer reads 100% chart or scale. Test gage should read Transmitter maximum output pressure. If reading is low, loosen screw on wedge clamp and shorten adjustable range arm to correct reading; if reading is high, lengthen range arm. Tighten screw.

6. Repeat steps 4 and 5 until correct minimum and maximum readings are obtained.

7. Adjust actuating unit so pen or pointer reads 50% chart or scale. Test gage should read Transmitter midrange output pressure. If reading is incorrect, loosen two screws on adjustable connecting link and adjust link to increase error by about four times. Tighten screws.

8. Repeat steps 4 thru 7 until correct output pressures are obtained at minimum, maximum, and midrange output pressure values.

9. If correct calibration cannot be obtained, recalibrate the Transmitter as follows:

a. Adjust actuating unit until Angles "A" (Figure 2) are about 90°. DISREGARD PEN OR POINTER POSITION.

b. Turn vane adjustment screw until midrange output pressure is obtained. Turn screw clockwise to increase or counterclockwise to decrease output pressure.

c. Then perform steps 4 thru 8 above.

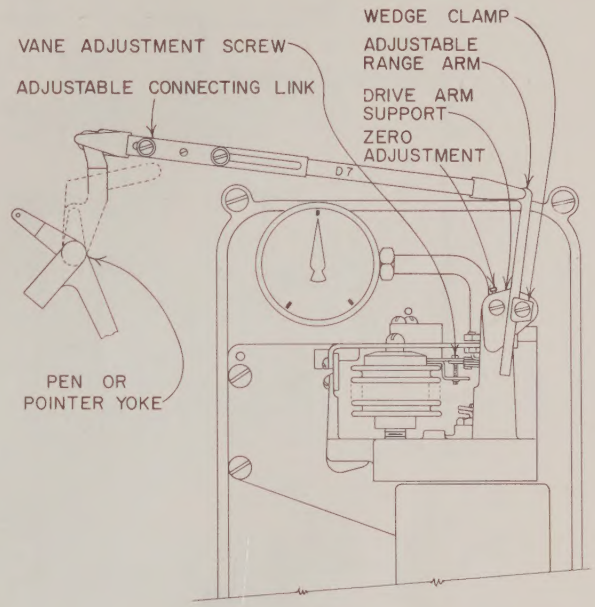


FIGURE 3 - Class P□ Adjustments

MAINTENANCE

The Class P□ Pneumatic Transmitter requires no routine maintenance. If Transmitter operates incorrectly, check for leakage with a soapsuds solution at all air connections. Check calibration of actuating unit and Reset Booster Relay (Instruction Section P99-7). Check Transmitter for broken or damaged parts or for friction in connecting linkage.

REPLACEMENT PARTS

Spare Parts Kits

The Spare Parts Kits shown in Figure 5 should be carried in stock. Specify the Spare Parts Kit part number to order a complete kit.

Ordering Individual Parts

Figures 4 and 5 are Parts Drawings of the Class P□ Pneumatic Transmitter. Normally these drawings will apply to the Transmitter furnished. However, there may be individual differences in specific Transmitters because of:

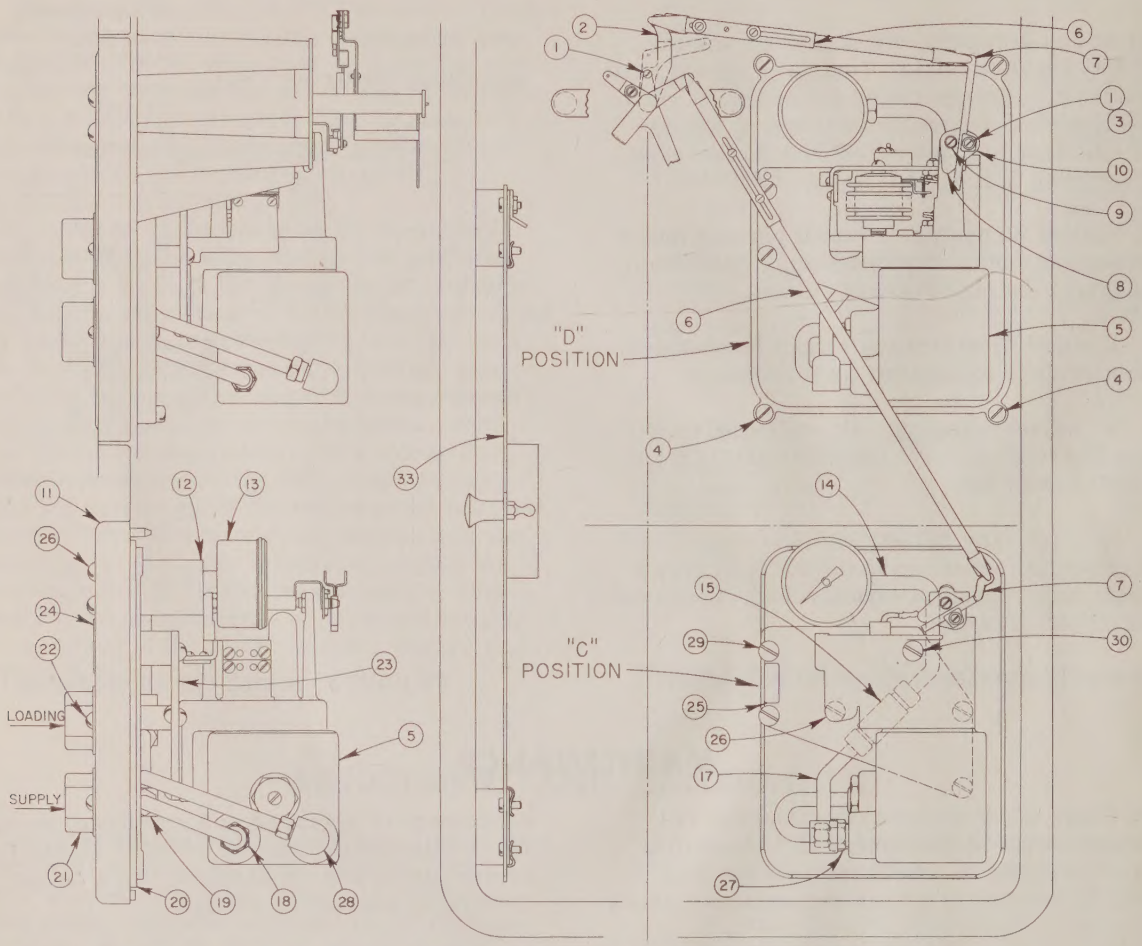
a. design changes made since the printing of this Instruction Section, and

b. special design of Transmitter to make it suitable for a specific application.

Therefore, when ordering parts, assure receipt of correct replacements by specifying on the order:

1. the complete nomenclature stamped on instrument nameplate and the Code Label Number (see Figures 4 and 5) of the Transmitter for which parts are desired, and

2. the Parts Drawing on which each part is illustrated. (The Parts Drawing Number is given in the Figure caption.)



NOTE 1. FOR PNEUMATIC TRANSMITTER SEE PARTS DWG P99-23.
NOTE 2. SPECIFY NUMBER ON CODE LABEL WHEN ORDERING PARTS
NOTE 3. FOR CHART PLATE ASSY SEE PARTS DWG E12-41 IN INSTRUCTION SECTION E12-3.

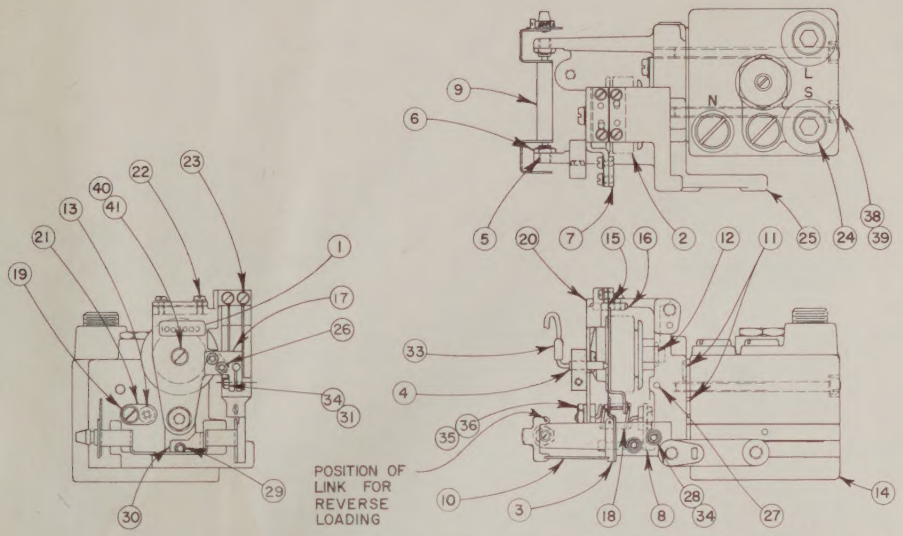
LIST OF PARTS

ITEM NO.	PART NO.	NAME
1	2-56 X 1/8"	RD HD SCREW, SEE TABLE
2	SEE TABLE	DRIVE ARM EXTENSION
3	19734-1	WASHER
4	10-32 X 3/4"	FIL HD SCREW, 4 REQ
5	SEE NOTE 1.	CLASS PD PNEU XMTR
6	SEE TABLE	CL. P CONNECTING LINK
7	SEE TABLE	CL. P DRIVE ARM
8	66 6335-1	DRIVE ARM SUPPORT
9	3-48 X 3/16"	RD HD EXT SEMS
10	66 1597-1	WEDGE CLAMP
11	68 2486-1	CLASS P SUPPORT PLATE
12	68 2481-1	LOADING GAGE MANIFOLD
13	195 853-1	SPECIAL LOADING GAGE
14	68 2484-1	CL. P LOADING AIR LINE
15	195 174-4	TEE CONNECTOR
17	68 2483-1	CL. P LOADING AIR LINE
18	68 2482-1	CL. P SUPPLY AIR LINE
19	1951187-2	ELBOW CONNECTOR
20	35 441-1	SEALING STRIP
21	68 2479-1	CONNECTOR ASSY, 2 REQ
22	10-32 X 3/16"	RD HD EXT SEMS, 4 REQ
23	68 2485-1	ADAPTER PLATE
24	196 1067-1	NAMEPLATE
25	SEE NOTE 2	CODE LABEL
26	10-32 X 3/8"	BIND. HD SCREW, 6 REQ
27	1951054-1	MALE CONNECTOR
28	1951187-3	ELBOW CONNECTOR
29	10-32 X 3/4"	BIND. HD SCREW, 2 REQ
30	10-32 X 1/2"	FLAT HD SCREW
33	SEE TABLE	CHART PLATE ASSY, SEE NOTE 3

TABLE

	ITEM 2 DRIVE ARM EXTENSION	ITEM 6 CONNECTING LINK	ITEM 7 DRIVE ARM	ITEM 33 CHART PLATE ASSY	ITEM 1 2-56 X 1/8 RD HD SCR	
CLASS PDBC	68 2476-1	35 800-19	35 420-1	35 438-2	2 REQD	
CLASS PDAD	5319031-1	35 800-20	682522-1	OMIT	1 REQD	
CLASS PDAC	68 2513-1	35 800-19	35 420-1	35 438-2	2 REQD	

FIGURE 4 - Parts Drawing P99-24, Class PD Pneumatic Transmitter



LIST OF PARTS					
ITEM	PART NO.	NAME	ITEM	PART NO.	NAME
1	CODE LABEL	SPECIFY NO. WHEN ORDERING PTS	25	SEE TABLE	SUPPORT BLOCK
2	45 2007-1	BELLOWS ASSEMBLY	26	4-40 X 1/4"	PAN HD SCREW 2 REQ
3	45 1953-1	VANE ASSEMBLY	27	68 411-1	PIVOT
4	45 1949-1	NOZZLE ASSEMBLY	28	4-40 X 5/16"	SOC HD SCREW, 2 REQ
5	45 1850-1	JEWELED BEARING, 2 REQ	29	4-40 X 5/8"	SOC HD CAP SCREW
6	197 132-4	PAL NUT, 2 REQ	30	45 2032-1	ADJ SCREW BRACKET
7	45 1956-1	CLAMP PLATE	31	4-40 X 1/4"	SOC HD SCREW
8	45 2009-1	SPRING SUPPORT			
9	45 2035-1	OFFSET DRIVE ARM	33	R9023-0129	B.M.CO. NO. 38 INSULATION TUBING 5" LG
10	45 2039-1	LINK	34	NO. 4 SAE	SPRING LOCKWASHER 5 REQ
11	53 11428-2	O-RING, 3 REQ	35	1208-00	SHKPRF LOCKWASHER 2 REQ
12	53 11428-3	O-RING	36	8-32	HEX NUT, 2 REQ
13	53 11428-10	O-RING			
14	SEE TABLE	BOOSTER RELAY	38	8-32 X 2 1/2"	FIL HD SCREW, 2 REQ
15	68 820-1	BELLOWS BEAM HINGE SPRING	39	NO. 8 SAE	SPRING LOCKWASHER 2 REQ
16	68 824-1	TAPPED PAD, 2 REQ	40	6-32 X 1/8"	PAN HD SCREW
17	SEE TABLE	CLAMP BLOCK	41	1206-00	SHKPRF LOCKWASHER
18	SEE TABLE	RANGE SPRING			
19	6-32 X 3/16"	PAN HD INT SEMS			
20	45 2040-1	BELLOWS BEAM			
21	45 1945-1	CONNECTOR ASSEMBLY			
22	3-48 X 1/4"	PAN HD EXT SEMS, 4 REQ			
23	2-56 X 3/16"	PAN HD INT SEMS, 2 REQ			
24	195 1041-1	PIPE PLUG, SEE TABLE			

TABLE							
USE	RANGE PSIG	PNEUMATIC TRANSMITTER PART NO.	ITEM 25 SUPPORT BLOCK	ITEM 14 BOOSTER RELAY	ITEM 18 RANGE SPRING	ITEM 24 PIPE PLUG	ITEM 17 CLAMP BLOCK
CLASS PA TRANSMITTER	3-27	45 2043-1	45 2005-1	53 19700-3	68 1870-1	OMIT	68 2461-1
CLASS PB TRANSMITTER	3-15	45 2043-3	45 2005-1	53 19700-3	68 971-1	OMIT	68 2461-1
CLASS PC TRANSMITTER	5-25	45 2043-1	45 2005-1	53 19700-3	68 1870-1	OMIT	68 2461-1
TYPE PG MULTI-POINTER GAGE, MODEL PA	3-27	45 2043-2	45 2005-2	53 19700-2	68 1870-1	2 REQ	68 834-1
TYPE PG MULTI-POINTER GAGE, MODEL PB	3-15	45 2043-4	45 2005-2	53 19700-2	68 971-1	2 REQ	68 834-1
TYPE PG MULTI-POINTER GAGE, MODEL PC	5-25	45 2043-2	45 2005-2	53 19700-2	68 1870-1	2 REQ	68 834 1
HALF CHART APPLICATION, CLASS PA□	3-27	45 2043-2	45 2005-1	53 19700-3	68 2474-1	OMIT	68 2461-1
HALF CHART APPLICATION, CLASS PB□	3-15	45 2043-1	45 2005-1	53 19700-3	68 1870-1	OMIT	68 2461-1
HALF CHART APPLICATION, CLASS PC□	5-25	45 2043-5	45 2005-1	53 19700-3	68 2474-1	OMIT	68 2461-1

SPARE PARTS KIT PART NO. 256160-1		
USE	QTY	ITEM NO.
CLASS PA1 & PC1 TRANSMITTER, TYPE PG MULTI-POINTER GAGE, MODEL PA & PC	1 EA	2, 10, 12, 13, & 18
HALF CHART APPL, CLASS PB2 & PB3	3 EA	11

SPARE PARTS KIT PART NO. 256160-2		
USE	QTY	ITEM NO.
CLASS PB1 TRANSMITTER, TYPE PG MULTI-POINTER GAGE, MODEL PB	1 EA	2, 10, 12, 13 & 18
	3 EA	11

SPARE PARTS KIT PART NO. 256160-3		
USE	QTY	ITEM NO.
HALF CHART APPLICATION, CLASS PA2, PA3, PC2, & PC3	1 EA	2, 10, 12, 13, & 18
	3 EA	11

FIGURE 5 - Parts Drawing P99-23, Class P□ Pneumatic Transmitter Details

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